Last revised: January 2000

Summary Status

Landings and Abundance Trends

Landings Data

PDF Version

# Atlantic Mackerel

by
William Overholtz

Atlantic mackerel, *Scomber scombrus*, is a fast swimming, pelagic, schooling species distributed in the Northwest Atlantic between Labrador and North Carolina. There are two major spawning components of this population: a southern group that spawns primarily in the Mid-Atlantic Bight during April and May, and a northern group that spawns in the Gulf of St. Lawrence in June and July. Both groups winter between Sable Island (off Nova Scotia) and Cape Hatteras in waters generally warmer than 7ºC (45ºF), with extensive northerly (spring) and southerly (autumn) migrations to and from spawning and summering grounds. The two groups are managed as a unit stock. Maximum observed size in recent years is about 47 cm (18.5 in) in length and 1.3 kg (3 lb) in weight. Sexual maturity begins at age 2 and is usually complete by age 3. Maximum age is about 20 years.

Mackerel are subjected to seasonal fisheries, both commercial and recreational, throughout most of their range. United States commercial landings have been taken primarily between January and May in southern New England and Mid-Atlantic coastal waters, and between May and December in the Gulf of Maine. United States recreational catches occur mainly between April and October. Canadian landings have typically been taken from off Nova Scotia and Newfoundland between May and November. The intensive distant-water fishery conducted between 1968 and 1977 occurred mainly between December and April from Georges Bank to Cape Hatteras.

Since April, 1983, the U.S. fishery has been managed under the Mid-Atlantic Fishery Management Council's Atlantic Mackerel, Squid, and Butterfish Plan. Management is based on annual quota specifications. For 2000, domestic annual harvest (DAH) was set at 75,000 mt within an allowable biological catch (ABC) of 347,000 mt.

Mackerel landings increased dramatically as effort by distant-water fleets intensified in the late 1960s, reaching a peak of roughly 430,000 mt in 1973. Landings subsequently declined to about 30,000 mt in the late 1970s, increased to about 87,000 mt in 1990, and then declined to 27,400 mt in 1995 and have increased slightly in subsequent years. Increases in landings in the 1980s

resulted from increased U.S. and foreign joint venture fishing operations. Landings for 1998 totaled 30,100 mt, of which 15,100 mt was taken by the U.S. (14,400 mt commercial; 700 mt recreational). Canadian landings decreased from 18,500 mt in 1997 to 15,000 mt in 1998.

Year classes from 1975 to 1980 were all relatively weak. Cohorts since 1981 have been much stronger (except for 1983), particularly the 1982 year class, which was the largest since 1967. Cohorts produced in the 1990s all appear to be relatively strong with the exception of the 1992 year class.

Total stock biomass (ages 1 and older) has continued to increase since the collapse of the fishery in the late 1970s. Although absolute estimates of stock biomass for the 1990s are not available, trial VPA analyses suggest that biomass is very high. Trends in research vessel survey indices suggest that abundance and biomass is probably at or near historic highs. Spring 1999 abundance and biomass index values were among the highest observed in the time series.

Rebuilding of the mackerel stock from relatively low levels in the late 1970s and early 1980s has resulted from low catches during 1978-1993 (average of 49,400 mt) as well as improved recruitment. Stock biomass levels are high and fishing mortality has been consistantly very low throughout the 1990s. The resource is not overfished and overfishing is not occurring. Catches can be increased substantially without adversely affecting spawning stock biomass.

**For further information**

Anderson, E. D., and A .J. Paciorkowski. 1980. A review of the Northwest Atlantic mackerel fishery. Rapp. P.-V. Reun. Cons. Int. Explor. Mer 177:175-211.

Overholtz, W. J., S. A. Murawski, W. L. Michaels, and L. M. Dery. 1988. The effects of density dependent population mechanisms on assessment advice for the northwest Atlantic mackerel stock. NOAA Tech. Memo. NMFS-F/NEC-62.

Overholtz, W. J., S. A. Murawski, and W. L. Michaels. 1990. Impact of compensatory responses on assessment advice for the Northwest Atlantic mackerel stock. Fish. Bull., U.S. 89:117-128.

NEFSC [Northeast Fisheries Science Center]. 1996. [Report of the] 20th Northeast Regional Stock Assessment Workshop (20th SAW) Stock Assessment Review Committee (SARC) consensus summary of assessments. Northeast Fish. Sci. Cent. Ref. Doc. 95-18. 211 p.

NEFSC [Northeast Fisheries Science Center]. 2000. [Report of the] 30th Northeast Regional Stock Assessment Workshop (30th SAW) Stock Assessment Review Committee (SARC) consensus summary of assessments. Northeast Fish. Sci. Cent. Ref. Doc. 00-03. 477 p.

**Summary Status**

| | | |
|---|---|---|
| Long-term potential catch (MSY) | = | 326,000 mt |
| SSB corresponding to MSY | = | 890,000 mt |
| Minimum biomass threshold | = | $^1/_4$ $B_{MSY}$ = 225,000 mt |
| SSB in 1998 | = | >2.0 million mt (Implies stock is not overfished) |
| $F_{MSY}$ [1] | = | 0.45 |
| $F_{TARGET}$ [1, 2] | = | 0.25 |
| Overfishing definition | = | $F_{THRESHOLD}$ [1, 3] = 0.45 |
| $F_{1998}$ | = | <0.05 (Implies overfishing is not occurring) |
| Age at 50% maturity | = | 1.9 years (both sexes) |
| Size at 50% maturity | = | 26.0 cm (10.2 in.), males |
| Assessment level | = | 25.7 cm (10.1 in.), females |
| Management | = | Mackerel, squid, and butterfish FMP |

**M = 0.20** **$F_{0.1}$ = 0.27** **$F_{max}$ = 0.98** **$F_{1998}$ = <0.05**

[1] F on biomass.

[2] The 10th bootstrap percentile of $F_{MSY}$.

[3] When SSB is greater than 890,000 mt, the overfishing limit is $F_{MSY}$ =0.45 and the target F = 0.25. $F_{THRESHOLD}$ decreases linearly from 0.45 at 890,000 mt SSB to zero at 225,000 mt SSB ( $^1/_4$ $B_{MSY}$) , and $F_{TARGET}$ decreases linearly from 0.25 at 890,000 mt to zero at 450,000 mt ( ½ $B_{MSY}$).

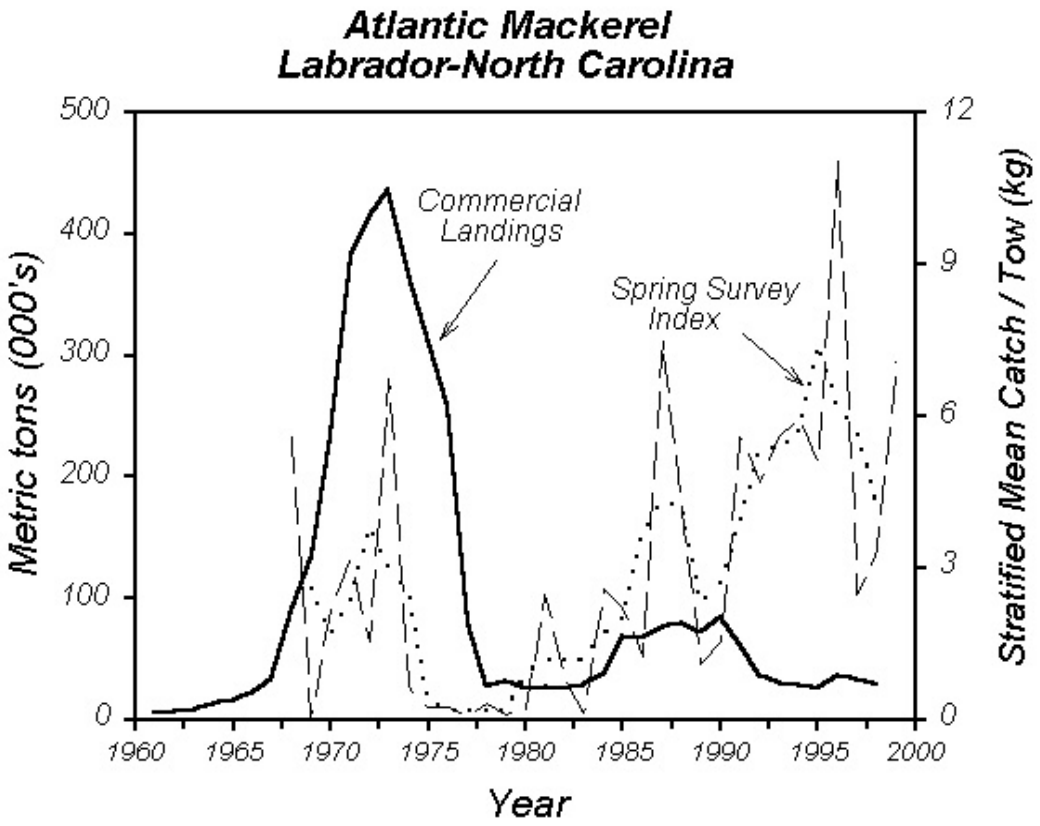


Table 22.1 Recreational catches and commercial landings (thousand metric tons)

| | | Year | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Category** | **1979-88 average** | **1989** | **1990** | **1991** | **1992** | **1993** | **1994** | **1995** | **1996** | **1997** | **1998** |
| U.S. recreational | 2.9 | 1.8 | 1.9 | 2.4 | 0.3 | 0.5 | 1.7 | 1.2 | 1.4 | 1.7 | 0.7 |
| Commercial | | | | | | | | | | | |
| United States | 6.2 | 14.6 | 31.3 | 27.0 | 11.8 | 4.7 | 8.9 | 8.5 | 16.1 | 15.4 | 14.4 |
| Canada | 23.9 | 21.1 | 23.0 | 20.9 | 25.5 | 26.9 | 20.5 | 17.7 | 20.4 | 18.5 | 15.0 |
| Other | 17.2 | 36.8 | 30.7 | 15.7 | | - | - | - | - | - | - |
| Total nominal catch | 50.2 | 74.3 | 86.9 | 66.0 | 37.6 | 32.1 | 31.1 | 27.4 | 37.9 | 35.6 | 30.1 |